In re Patent Application of:
WESTPHAL
Serial No. **10/655,766**
Filed: **SEPTEMBER 5, 2003**

In the Drawings

Attached is a letter to the Draftsman with a new drawing sheet containing Figure 11.

REMARKS

Claims 1-12 remain in the application. Claims 1-12 stand rejected.

Applicants appreciate the Examiner's reconsideration and withdrawal of the previous Final rejection.

Drawing Objection

The Examiner objected to the drawings under 37 C.F.R. § 1.83 as failing to show every feature of the invention specified in the claims. In response to this objection, applicants have provided a new drawing, Figure 11, and accompanying letter to the Draftsman. Concurrently, the specification has been amended to reflect the presence of Figure 11 in the brief description of the drawings and to add a description of Figure 11 to the specification. Support for item 100 of Figure 11 (the computer) is found in claim 1, limitation a and with respect to items 1100A and 1100B is found in claim 5, limitation a. Support for the network 1110 is found in claim 5, limitation a. Support for a computer readable storage medium 1120 is found in claim 8, limitation a. Support for a computer program 1130 is found in claim 8, limitation b. Support for the storage medium reader 1140 is found in claim 8, limitation a, and support for CAD CAM programs 1150 are found on page 11 of the specification.

Since all of the claims referred to in this paragraph are original claims, they are part of the original specification and provide adequate support for the drawing as illustrated.

Accordingly, applicants have complied with the Examiner's requirement to add a drawing figure.

35 U.S.C. § 101 Rejection

The Examiner rejected claims 1, 2, 5-7, 8 and 9 under 35 U.S.C. § 101 "because the claimed invention are not supported by either a credible asserted utility or a well established utility." Claim 1 is directed to a "design of logic circuits" and claims 5-7 are directed to "system for design or manufacturing of logical circuits." The design of logic circuits and the manufacturing of logic circuits are both well-known commercial functions that have utility in the real world. Therefore each of those claims has a credible utility (as opposed to "incredible") and each constitute a well-established part of the economic life of the country.

On page 3 of the office action, the Examiner states:

> "Examiner recognized that the claims 1, 5, 8 and 9 have a computer, software and processed steps. However, there are no tangible result has been produced because there is no interaction between the software and the computer. When the computer readable storage medium stored software does not cause the computer to perform the processed steps, a specific and tangible result will never be produced. Therefore, the claimed invention are not supported by either a credible asserted utility or well established utility. In

> addition, without claiming execution part of the computer or causing the computer to execute or perform the processed steps or do something, a tangible result will never be produced. As a result the claimed invention are not supported by either a credible asserted utility or a well established utility."

The Examiner's position is contrary to law. (See In re Beauregard, 35 USPQ2d 1383. (CAFC 1995.) A copy of that decision is attached hereto as Appendix A. Also included is a copy of an article regarding the history of In re Beauregard, entitled Patenting of Software which is attached hereto as Appendix B. The Examiner's position violates the settlement agreement entered into by the Patent and Trademark Office through its Solicitor's office and International Business Machines, and violates the reason the CAFC acted as it did.

The Examiner's "no tangible result" holding violates the Patent and Trademark Office's own internal guidelines regarding 35 U.S.C. § 101.

On or about October 26, 2005, United States Patent and Trademark Office issued "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Interim Guidelines). The claims of this application comply with those Interim Guidelines as more particularly set forth in the following.

As a starting point, the Supreme Court has held that 35 U.S.C. 101 includes "anything under the sun that is made by

man." Diamond v. Chakrabarty, 447 U.S. 303, 308-09, 206 USPQ 193, 197 (1980). The court also noticed that Congress plainly contemplated that the patent laws would be given a wide scope. Relevant legislative history also supports a broad construction of the patent statute. (See Interim Guidelines, page 11).

Nevertheless, the courts have found three judicial exceptions to the broad scope of statutory subject matter set forth in Diamond v. Chakrabarty. These three judicial exceptions are: (1) abstract ideas, (2) laws of nature and (3) natural phenomena. Except for these three categories of exceptions, a claimed invention is presumptively statutory. The Examiner has a burden of proof of showing that claimed inventions are non-statutory.

A cursory review of the claims of this application will reveal that they are not directed to "abstract ideas", "laws of nature" or to "natural phenomenon." This determination corresponds to the determination that the Examiner must make as set forth in Section C, beginning on page 16 of the Interim Guidelines.

If, and only if, the Examiner determines that the invention covers one of the three judicial exceptions, the Examiner then must determine whether or not the claimed subject matter covers a practical application (which is patentable subject matter) of one of those three judicial exceptions. (See page 18 of the Interim Guidelines.)

The PTO sets forth, on page 19 of the Interim Guidelines, how to determine whether or not a claimed invention, which includes subject matter of the three judicial exceptions, is a practical application and therefore patentable. There are two ways in which a claimed invention can be shown to constitute a practical application of one of the three judicial exceptions.

The two ways utilized to determine whether a practical application is claimed are:

1. The claimed invention "transforms" an article or physical object to a different state or thing.

2. The claimed invention otherwise produces a useful, concrete and tangible result.

Note that these tests only come into play after an Examiner has determined that the claims include an "abstract idea", a "law of nature" or a "natural phenomenon".

If one of the three judicial exceptions to statutory subject matter is not included in the claims, there is no need to proceed to consider whether or not the claims constitute a practical application of the §101 judicial exceptions, as the Interim Guidelines state on page 19:

> "To satisfy section 101 requirements, the claim must be for a practical application of the section 101 judicial exception…."

Informal conversations with a variety of Examiners indicates that, in some parts of the PTO, the "transformation" test or the "useful, concrete and tangible" test are being required, whether or not the claimed subject matter is found to include an abstract idea, laws of nature and natural phenomenon, (one of the three judicial exceptions). That approach is contrary to the law and contrary to the Interim Guidelines.

In this case, the Examiner has made no finding that the claimed invention includes an abstract idea, a law of nature or a natural phenomenon. Thus, there is no place in the analysis of the claimed invention for the "transformation" test or for the "useful, concrete and tangible result" tests that are associated with claimed subject matter that includes thee three judicial exceptions.

Further, even if the claims were subject to the "transformation" and "useful concrete and tangible" tests, notwithstanding that they do not include an abstract idea, a law of nature or a natural phenomenon, the claims still are directed to statutory subject matter.

First, the claimed invention "transforms" a logical schema represented in vector form into a simplified form so that simplified form can be implemented in computer hardware with fewer circuit components and paths. Each of the independent claims make such a "transformation" and thus each

of the independent claims satisfy the "transformation" test for patentable subject matter under 35 U.S.C. § 101.

The "useful, concrete and tangible" test is also met by the claims.

The "useful" portion of the test is discussed beginning on page 20 of the Interim Guidelines, the PTO requires that the utility of the invention be (i) specific, (ii) substantial and (iii) credible. As discussed above, simplifying a logic design so that it utilizes fewer circuit components provides a specific and substantial benefit to the semiconductor industry. By being able to reduce the number of components, the heat dissipation of a particular integrated circuit can be reduced and the cost of manufacture can be reduced since fewer manufacturing steps are needed to produce fewer components. The Examiner has not made any indication that such a utility is not "credible."

The "tangible result" portion of the test is discussed beginning on page 21 of the Interim Guidelines, there the PTO states that:

> "the tangible requirement does require that the claim must recite more than a §101 judicial exception, in that the process claim must set forth a practical application of that §101 judicial exception to produce a real-world result."

First, the claims do not include a "judicial exception." They do not include an "abstract idea", a "law of nature" or a

"natural phenomenon" and therefore are not subject to the "tangible result" test. Second, the claims comply with that test in any event. There is a "real-world" (tangible) result.

The tangible results are a simplified logical design that will be implemented in silicon at a much reduced cost with fewer heat problems and with the lower circuit density that would otherwise be required. As a result, reliability would tend to increase. There are real world tangible results.

The "concrete" result test is discussed beginning on page 22 of the Interim Guidelines. The PTO states that the opposite of "concrete" is unrepeatable or unpredictable. The claimed invention will produce a result that is repeatable and predictable. The Examiner has not demonstrated otherwise. Thus the claimed invention is concrete.

For the reasons indicated, claims 1-12 are statutory under 35 U.S.C. § 101.

35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 1, 2, 5-7, 8 and 9 under 35 U.S.C. § 112, second paragraph, as being incomplete "for omitting essential structural/functional cooperative relationships of elements."

The Examiner states futher:

> "The omitted structural/functional cooperative relationships are: the software stored on a computer readable medium [be more

> specific) causing the computer to perform the processed steps or causing the computer to execute the processed steps. Without structural/functional connections as described or without the computer readable medium having instructions to instruct or command the computer to perform the processed steps, there is no structural/functional connections between the software, computer and the processed steps. Thus, the claims lack necessary structural/functional relationships or connections."

35 U.S.C. § 112, second paragraph states:

> "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

Thus, it is applicant who determines what applicant regards as his invention. The claimed invention has been particularly pointed out and distinctly claimed.

The Examiner says that what is omitted is actually causing the computer to execute the steps of a program.

Claims 1-2 relate to a unique "apparatus" and claims 5-7 relate to a "system" for design or manufacturing of logical circuits. To say that such unique apparatus or systems are incomplete because the computer is not up and running (power switch turned on) is like saying that a manufacture of an automobile could never be liable for infringement of an automobile patent unless the manufacture turned the automobile on and drove it. This has never been the law.

35 U.S.C. § 112, second paragraph has never been interpreted as requiring additional limitations of the nature the Examiner requests.

Claims 8 and 9 relate to computer program products. The Patent and Trademark Office agreed that computer programs stored on a storage medium were per se patentable in In re Beauregard, copy attached as Appendix A. No operation of the computer actually executing program instructions is required.

Accordingly, applicant respectfully request that the Examiner reconsider this aspect of the rejection and withdraw it.

The Examiner also rejected claims 1, 5° and 8 under 35 U.S.C. 112 second paragraph as incomplete. The Examiner asserts that Applicant should insert the phrase "eliminating opposing couples in the independent claims." Applicant respectfully disagrees. Each of claims 1, 5 and 8 recite "exploiting symmetries" which is a broader or generic form of the phrase "eliminating opposing couples". "Eliminating opposing couples" is one way of carrying out exploiting symmetries. Applicants are entitled to all ways of exploiting symmetries and not just to the specifically disclosed preferred embodiment.

The Examiner is essentially requiring that applicants include the limitations of dependent claims 2 and 7 which recite "eliminating opposing couples" into the independent

claims 1, 5 and 8, each of which utilize the phrase "exploiting symmetries." Accordingly, the claims are not at all incomplete and are not subject to a rejection under 35 U.S.C. § 112, second paragraph.

The Examiner indicates that claims 2, 6 and 7 are "virtually rejected" if applicant does not agree with the Examiner. Applicant is uncertain what the phrase "virtually rejected" means. Applicants have argued that the rejection of the independent claims is inappropriate and that argument applies equally well to dependent claims 2, 6 and 7.

Obviousness Type Double Patenting

The Examiner has made a provisional rejection of claims 1-12 under the judicially created doctrine of obviousness-type double patenting as unpatentable over claims 1-13 of co-pending application number 10/931,456. The claims of that patent each are directed to logical schema having multiple outputs.

As shown from the disclosure of the '456 patent application, the techniques for simplifying logical schema that have multiple outputs is quite different from that utilized for logical schema having only a single output. The Examiner has not attempted to show that a multiple output problem could be simplified utilizing the techniques of this application. Accordingly, the Examiner has failed to establish a prima facie case of obviousness type double patenting.

The claims are different. The techniques for simplifying the schemas are different and the Examiner has failed to establish a prima facie case of obviousness of one set of claims over the other. Accordingly, applicant respectfully request that the Examiner reconsider the provisional obviousness-type double patenting rejection and withdraw it.

Conclusion

The applicant would like to thank the Examiner for an indication that claims 3-4 and 10-12 would be allowable over the prior art of record with the exception of the double patenting rejection.

For the reasons indicated, applicant respectfully request that the Examiner withdraw all of the rejections and permit the application to issue as a patent.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to

In re Patent Application of:
WESTPHAL
Serial No. **10/655,766**
Filed: **SEPTEMBER 5, 2003**

Deposit Account No. 01-0484 and please credit any excess fees to such deposit account.

Respectfully submitted,

DAVID L. STEWART
Reg. No. 37,579
Allen, Dyer, Doppelt, Milbrath
& Gilchrist, P.A.
255 S. Orange Avenue, Suite 1401
Post Office Box 3791
Orlando, Florida 32802
407-841-2330

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MAIL STOP AMENDMENT, COMMISSIONER OF PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450, on this 21 day of June, 2006.

Appendix A

items therefore cannot be admitted
ly as showing "reasonable possibil-
cess.

---

by Eddie Palmieri against Gloria
Jorge Cases, Clay Ostwald, Sony
tertainment Inc., and others, for
infringement. On defendants' mo-
nine to exclude certain areas of
proposed evidence on issue of de-
omposer's alleged access to copy-
ng. Granted in part and denied in

Caplan, of Goodkind, Labaton,
& Sucharow, New York, N.Y., for

Hayes, of Parcher & Hayes, New
ail E. Edwin, New York, for
nts.

J.

nts move *in limine* to exclude cer-
f plaintiff's proposed evidence on
f defendant-composer's alleged
plaintiff's song, "Paginas de
ur areas are at issue: (1) a) radio
the song, and b) royalty state-
d by BMI; (2) testimony of Jose
arding the song being played at
ily gatherings, as well as Jose
leotapes of certain of those gath-
evidence that plaintiff's record
ed by two friends of defendant
an; and, (4) evidence of plain-
sales.
in a copyright case "must offer
affirmative and probative evi-
port a claim of access." *Inter-*
. CBS Inc., 757 F. Supp. 274,
PQ2d 1828] (S.D.N.Y. 1991)
itted). "Wide dissemination" of
be a proper basis for inferring
CO Music, Inc. v. Harrisongs
722 F.2d 988, 998 [221 USPQ
r. 1983). In contrast, a "bare
at defendant had access to the
t suffice. *Repp. v. Lloyd Web-*
Supp. 1292, 1301 [32 USPQ2d
.Y. 1994) (citations omitted).
question is whether several
lence, each of which at most
the fact finder to find a "bare
hould be received in combina-
ly cumulate to a "reasonable
access. I do not, however, see
nclusion could properly flow,

and accordingly, decline to consider the items collectively under this rubric.

[1] Turning first to the issue of radio play, plaintiff cannot present probative evidence of the number of times his song was played, nor can he adequately demonstrate that the defendants listened to a radio station that may have played his song. In addition, BMI royalty statements to its members, here Palmieri, do not constitute legally sufficient evidence of total actual radio play. Thus, the BMI payments for "327 performances" of his song in a six-month period in 1984, is a formulaic extrapolation based on only five actual performances BMI monitored at various radio stations over that six months. Accordingly, the radio play evidence, including BMI statement, is excluded as insufficient as a matter of law to infer access.

Next, defendants move to exclude evidence that two of Gloria Estefan's associates possessed recordings of plaintiff's song. One, a former Miami Sound Machine band member named Victor Lopez, left the band two years before "Oye Mi Canto" was composed and testified at his deposition that he neither played "Paginas de Mujer" for Gloria Estefan nor loaned her the album. This evidence is accordingly not probative of access. The second associate, Julio Faz, was a deejay who possessed plaintiff's album as part of his 15,000 record collection. Again, evidence that Gloria Estefan may have been present in a room with the entire 15,000 record collection, without more, is not probative of access. I observe that evidence regarding Lopez and Faz does not fall under the line of cases holding that access can be inferred from an intermediary's possession of the plaintiff's work. Those cases involve more than a mere allegation that someone known to the defendant possessed the work in question. *See, e.g., Gaste v. Kaiserman*, 863 F.2d 1061, 1066-67 [9 USPQ2d 1300] (2d Cir. 1988) (plaintiff alleged defendant acquired copy of his song from defendant's publisher); *Moore v. Columbia Pictures*, 972 F.2d 939, 942-44 [23 USPQ2d 1864] (8th Cir. 1992) (plaintiff's tape given to two people who were creatively involved with defendant songwriters).

Evidence that Jose Estefan, Gloria's brother-in-law, had plaintiff's record and played the song at a family gathering at which defendants Gloria and Emilio Estefan *may* have been present is not probative of access. In his deposition, Jose could not state with certainty at what family gathering plaintiff's song was played, concluding that it was played some time between the years 1986 and 1990. The speculative aspects of this proof are several. First "Oye Mi Canto" was composed in the fall of 1988. Second, Jose has stated that Gloria and Emilio did not attend every gathering and that he could not say he had ever seen Gloria or Emilio listen to plaintiff's song. "Conjecture or speculation of access will not suffice." *Intersong*, 757 F. Supp. at 281. In any event, Jose Estefan's videotapes of family gatherings, having no music on them, are irrelevant and excluded.

Defendants also seek to exclude evidence of plaintiff's record sales. This is an area where, on this record, I am unable to assess the propriety of its admissibility. Accordingly, I deny the motion *in limine* and await the proffer of evidence, subject to a possible motion to strike.

In sum, defendants' motion is granted with respect to the following evidence to the extent it is offered to prove access: radio air play, BMI royalty statements, Lopez and Faz's ownership of plaintiff's album, and Jose Estefan's deposition and videotape evidence regarding family reunions. The motion is denied without prejudice with respect to evidence regarding record sales.

The foregoing is so ordered.

U.S. Court of Appeals
Federal Circuit

In re Beauregard

No. 95-1054

Decided May 12, 1995

PATENTS

1. Patent grant — Inventions patentable (§105.05)

Patentability/Validity — Subject matter (§115.05)

Decision of Board of Patent Appeals and Interferences rejecting applicants' computer program product claims on basis of printed matter doctrine is vacated, since Patent and Trademark Office now states that computer programs embodied in tangible medium, such as floppy diskettes, are patentable subject matter under 35 USC 101 and must be examined under 35 USC 102 and 103.

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Gary M. Beauregard, Larry K. Loucks, Khoa Dang Nguyen

and Robert J. Urquart. From decision upholding rejection of application claims, applicants appeal. On motion of Patent and Trademark Office to dismiss appeal for lack of subject matter jurisdiction. Vacated and remanded.

Nancy J. Linck, solicitor, Albin F. Drost, deputy solicitor, and Richard Torczon, associate solicitor, for PTO.

Robert Greene Sterne, of Sterne, Kessler, Goldstein & Fox, Washington, D.C., for appellant.

Archer, C.J.

ORDER

The Commissioner of Patents and Trademarks moves to dismiss Gary M. Beauregard et al.'s appeal. Beauregard responds stating that vacature or reversal of the Board of Patent Appeals and Interferences' decision and remand to the Board is the appropriate disposition. Beauregard requests that the remand order be issued as a precedential order.

[1] Briefly, on August 4, 1994, the Board rejected Beauregard's computer program product claims on the basis of the printed matter doctrine. Beauregard appealed. The Commissioner now states "that computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter under 35 U.S.C. § 101 and must be examined under 35 U.S.C. §§ 102 and 103." The Commissioner states that he agrees with Beauregard's position on appeal that the printed matter doctrine is not applicable. Thus the parties are in agreement that no case or controversy presently exists.

Accordingly,

IT IS ORDERED THAT:

The Board's decision is vacated and the case is remanded for further proceedings in accordance with the Commissioner's concessions.

Appendix B

Patenting of Software—Proposed Guidelines and the Magic Dividing Line that Disappeared

*David L. Stewart**

On September 29, 1993, the Board of Patent Appeals and Interferences rendered an expanded panel decision in *Ex parte Beauregard*[1] holding that a computer program on a computer diskette was non-statutory under 35 USC 101 and that the programmed diskette failed to distinguish over a diskette with a different program thereon under 35 USC 103.[2] The patenting of programmed diskettes *per se* had not been raised so directly before.[3]

The majority seemed troubled by trying to draw the line between software and literary or artistic expression. The Board queried rhetorically: "Where is the magic dividing line between music, or voice or video or computer programming when they are all the same?" The

The author is a former Administrative Patent Judge of the Board of Patent Appeals and Interferences, former staff advisor to the Assistant Commissioner for Patents and former Chief Petitions Examiner. The author currently is of Counsel at Lowe, Price, LeBlanc and Becker, in Alexandria, Virginia.

The opinions expressed herein are those of the author alone and do not necessarily reflect the views of Lowe, Price LeBlanc and Becker nor of any of the firm's clients.

1 The seven member panel split 4-3 with Administrative Patent Judges Pellman, McCandlish, Lynch and Hairston in the majority and with Chairman Serota, and Administrative Patent Judges Lovell and Krass dissenting.

2 The only difference resided in differences of "printed matter." *In re Gulack*, 703 F.2d 1381, 217 USPQ 401 (Fed. Cir. 1983).

3 Claim 22, for example, reads:

22. An article of manufacture comprising:

a computer usable medium having computer readable program code means embodied therein for causing a polygon having a boundary definable by a plurality of selectable pels on a graphics display to be filled, the computer readable program code means in said article of manufacture comprising: [Ed. the claim then sets forth three recitations beginning "computer readable program code means for . . ." followed by respective recitations of functions of the computer program disclosed in the specification]

In an earlier application, the USPTO had allowed claims to a computer with the same computer program loaded.

Board then answered its own query with the determination that there was no difference.

Appellants appealed to the Court of Appeals for the Federal Circuit.

Appellants filed their brief[4] and were supported by ten organizations[5] filing briefs *amicus curiae*.

The USPTO moved the Court to remand and the motion was denied. Then, USPTO and assignee IBM moved jointly to dismiss the appeal as lacking subject matter jurisdiction since no case or controversy existed. Both parties agreed that the claimed subject matter was patentable. The Federal Circuit granted the motion.[6]

The USPTO published a set of Proposed Examination Guidelines for Computer Implemented Inventions for public comment.[7] The proposed Guidelines are intended to give Examiners directions on how to implement the USPTO's revised view of software patenting in view of *Beauregard's* dismissal.

In agreeing that a memory unit with a program stored thereon is patentable subject matter, the Assistant Secretary and Commissioner of Patents and Trademarks (Commissioner) acknowledged that software is a significant component of the nation's gross domestic product and that the software market is as important domestically as is the opening of overseas markets.[8]

Nature of Software

What is this software which has caused the U.S. Patent and Trademark Office and the Courts so much difficulty.

A broad definition of software includes not only computer programs but also the documentation and packaging which accompanies

4 Beauregard's application is assigned to IBM Corporation.

5 The Organizations included: (1) the American Intellectual Property Law Association, (2) the Information Technology Industry Council (formerly CBEMA), (3) the Federal Circuit Bar Association, (4) Intellectual Property Owners, (5) Taligent, Inc., (6) the Houston Intellectual Property Law Association, (7) the California Multimedia & Software Patent Alliance, (8) the Philadelphia Intellectual Property Law Association, (9) the Minnesota Intellectual Property Law Association and (10) the Colorado Bar Association.

6 In re Beauregard, 35 USPQ2d 1383 (Fed. Cir. 1995).

7 Guidelines for Computer-Implemented Inventions, 60 FR 28778 (June 2, 1995); 1175 Off. Gaz. Pat. Office 86 (June 27, 1995).

8 The economic significance of software is well documented elsewhere. Why software should be protected as a product is not immediately obvious. Although beyond the principal focus of this paper, discussions of this issue can be found in the amicus briefs filed by, *inter alia*, the AIPLA (section 2), the Information Technology Industry Council (section IA and IB), Taligent, Inc. (Section IB).

them. We do not adopt this definition for purposes of this article. For this article, software will be synonymous with computer programs.

Software differs from text in that it is utilized to do something, rather than communicate information. Performance or functionality distinguishes software from text. However, software is constructed, typically, using text. Software in its various forms may also describe that which is performed.

Software on a diskette is inherently passive, i.e. unable to perform a function, until it is loaded into a computer and executed.[9]

Software has been compared to a tool, such as a drill bit[10] which adapts a general purpose instrument or machine to a particular purpose. It has also been analogized to DNA[11] which contains the encoding needed for an organism to reproduce and function.

One of the realities of both hardware and software is that they are implemented in micron level geometries. Hardware is often implemented in integrated circuit form in which line widths are on the order of microns or less. Software is implemented by storing it on diskettes, magnetic or optical, in which the size of elemental storage units is of the same order of magnitude. Software can always be implemented (at least today) using hardware logic circuits. The converse is not necessarily true.

Optically, a human cannot resolve features at the micron level. Viewed externally, one cannot distinguish whether a wafer contains a program stored magnetically or optically from a hardware implementation of the same program.

At micron geometries, humans have only mental models of what goes on. The terms we use to describe what goes on at these dimensions are terms derived from macro level analogies which correspond to our mental models. They should not be confused with the underlying reality.[12]

---

9 Notwithstanding arguments asserted in Beauregard's brief on appeal to the CAFC and in some of the *amicus* briefs.

10 Amicus Brief by the Philadelphia Intellectual Property Law Association, page 2.

11 Amicus Briefs by the Houston Intellectual Property Law Association, page 2; and by the Intellectual Property Owners, page 6.

12 A computer program on a diskette does differ from literary text on a diskette in that the internal representations of a computer program contain control information, such as conditional branch instructions which selectively permit different control sequences, once the program is loaded into a computer. Literary text, on the other hand is normally linear, in the sense that it does not permit different routes from start to finish. However, recently, some novels have been published with reader specified decision points which customize the content to the reader's choices.

When considering the nature of software, it should be noted that software does not always require a medium in the computer on which it is running. In certain situations, such as when sending a stream of commands which are executed at the receiving end, sending software over a network does not necessarily result in a copy. However, the benefits of the software are nevertheless transferred to a user.

SYMBOLIC COMMUNICATIONS

Much of the uncertainty in the legal precedents relating to software can be resolved by realizing that natural language speech, natural language text, computer programs in source code or object code, mathematical expressions, art and music are all forms of symbolic communications. A wide variety of apparently divergent systems of symbolic communications share a common language structure which permits a more rigorous analysis.

At the lowest level, each form of symbolic communications has a symbol set.[13] For English text, the symbol set includes, inter alia, A-Z, a-z and 0–9 and punctuation marks. For source code and assembly language, the symbol set is much the same. For object code, the symbol set consists of "0" and "1". For natural language speech, the symbol set comprises a set of sounds, pauses and intonations from which all words in the language are formed. For visual languages,[14] the symbol set comprises shapes, line thickness, line texture, fill, color and the like. For music, the symbol set comprises a staff, note symbols indicating timing, the placement of which on the staff defines the notes, certain operators (e.g. a repeat symbol) an indication of meter and the like. For mathematics, the symbol set comprises, traditionally, Greek and English alphabets, numbers and specialized operator symbols.

At the next highest level, symbols from a symbol set can be grouped into "terminals."[15] Terminals are the lowest non-divisible unit of meaning or expression. For natural language text, terminals comprise combinations of elements from the symbol set (alphabet) which are accepted as proper words. For source code and assembly language, the terminals include variables, operators and objects which resemble natural language words. In source code, addresses in memory are assigned

13 Summarized from *LR Parsing* by Nigel P. Chapman, 1987.

14 An example of a visual language might be an artificial language constructed for use with a graphical user interface. The basic symbol set of art is used by artists using a paint medium to construct their symbolically communicative paintings.

15 *Natural Language Processing in Prolog: An Introduction to Computational Linguistics*; Gazdar, Gerald eta al.; Addison-Wesley Publishing Company; 1989.

names to make them more understandable to humans. For object code, binary words constitute the terminals. For spoken natural language, the terminals consist of the various combination of sounds which form the accepted words of the language. For visual languages, the terminals are the set of objects formed by combinations of the elements of the symbol set.[16] In music, the terminals are combinations of sounds which are to be played simultaneously. In mathematics, the terminals are variable names, constants and operator symbols.

In these various languages, statements or phrases are formed by linking terminals and operators together in accordance with rules which constitute the *grammar* for the language.[17] The *semantics* of a language relates to the meaning associated with various arrangements of terminals and statements.

HUMAN-COMPUTER COMMUNICATIONS

Each computer processor typically understands only a particular form of binary language. It has associated with it a binary command set, typically composed of binary terminals describing a command and, optionally, addresses from a memory space for the retrieval of values which are to be operated on by the command and for the placement of results when the command has been completely executed.

Humans originally learn a spoken natural language and then progress to the written form (text) of that language.

The history of human communications with computer processors started with humans composing statements directly in machine language. It rapidly became apparent that humans are ill suited to conversations and interactions in binary.

Assembly language utilized a variety of mnemonics for each command of a computer's command set which could be more easily recalled by a human. Translators converted the mnemonics into the binary commands for which they stood.

A number of statements of assembly language were required to implement even simple operations in binary. To multiply two numbers together, for example, required statements retrieving one number from

16 For example, a representation of "stop sign" as the term is used in American English is represented in a visual language as an octagon with red fill with the letters "S", "T", "O" and "P."

17 In music, for example, many of the differences between various styles of music reside in the grammar. For example "oriental" music and occidental music differ not only in the selection of notes which constitute acceptable chords, but in the sequence and timing of chords which are acceptable in accordance with the grammar.

memory and placing it in a register, retrieving the other number from a different location in memory and placing it in a different register, executing the multiply command which was unique to the two registers and which defined a destination for the product, and then moving the product from the destination register into a desired location in memory.

"Higher level" languages would permit a simple statement, such as

$$C =: A * B$$

to be translated into either assembly language for use with a translator or directly into binary using a compiler.

Higher level computer languages are considered "higher" because they are more similar to natural languages. They are more comfortable to the user because they resemble as much a possible a human's own language. Ideally, a human could speak or type instructions to a computer using the human's "natural" language—but, since the computer understands only binary and has only a limited vocabulary, considerable modification of natural language would be required to get a message into a form a computer would understand.

High level computer languages differ from natural languages in having a finite vocabulary (only certain "words" are acceptable), a strict and unforgiving syntax (if you don't use a command exactly correctly, you get an error message) and a very limited grammar. Ambiguity is not tolerated. Ambiguity is the universal curse of natural languages.

Story vs Program

It is instructive to compare a literary description of a story with a computer program. A story typically has a hierarchical organization and a temporal sequence. Terminals (words) are formed from members of the symbol set (alphabet) and formed into expressions (sentences). A computer program too has terminals (words) constructed from members of the symbol set (alphabet) and formed into expressions (statements).

A story has sentences formed into paragraphs; paragraphs into chapters; chapters into the overall story. A computer program has statements formed into subroutines; subroutines into sub-systems and sub-systems into the overall system.

A story has characters and a sequence of interactions. A program has data objects and a sequence of interactions.

Herman Melville's story Moby Dick can be virtually indistinguishable from a computer program simulation of the story. A data object would be formed for each of the characters listing the important features of the character. The name of the data object could be exactly the name of the character. A set of human to human and human to animal interactions could be defined which are dependent upon the features of the object. A simulation time line defines the sequence of certain events. Events involve the interaction of data objects in accordance with the defined interactions, and so on. The simulation could be deterministic, in which case the program could parallel the story exactly, or probablistic, in which case the Captain could sometimes win.

Almost exact parallels exist between computer programs and representations in other formal systems of symbolic communications, including the classical languages of art and music.

MATHEMATICS

Mathematics is a specialized language. Its symbol set is described above. Its operators tolerate a limited syntax. Its grammar is specialized in that it permits only those statements or operations which preserve truth value, so that by following the rules, one can take beginning statements known or assumed to be true, perform operations according to the rules and obtain different statements at the end which are also true. Assuming consistent semantics, the ending statements are guaranteed true and may reveal relationships about the starting statements which were previously unknown.

TEST BOUNDARIES NOT A BRIGHT LINE

As suggested above, the languages of art, music and literature do not differ substantially from computer languages. They are remarkably similar because they are all forms of symbolic communications.

The majority opinion in *Beauregard* asked: "Where is the magic dividing line between music, or voice or video or computer programming when they are all the same?" The Board answered there was no difference. Viewed from a framework of symbolic communications, the Board may have been right.

Beauregard's brief and the briefs amicus curiae in support of Beauregard differed in their answers to the Board's question.

Beauregard argued:[18]

18 Brief for Appellants, page 15.

There is a bright dividing line between functional computer programs and 'mere' computer data, including multimedia.
The 'dividing line' sought by the Board is in fact simple to draw. Section 101, requires that an invention or discovery be 'useful' in order to be statutory.

While a computer program differs from the fine arts generally in that it performs or can perform a function, "utility" may not be the way to describe it, since music, art and literature do perform socially useful functions. They relax, inspire, inform and transmit culture—all very useful functions.

The AIPLA brief stated:[19]

To conclude that music, voice, video and computer programming are 'all the same thing' merely because they may all be electronically stored on the same type of media is precisely the type of analysis which lead to . . . [the CAFC] reversal of the Board in *Alappat*.

The Board decision did not specify why they concluded that music, voice, video and computer programming were all the same thing. It is not clear that it was because "they may all be electronically stored on the same type of media."

The brief for the Information Technology Industry Council returned to the "primary authorities" (Supreme Court Cases) which they determined.[20]

remove the 'magic' . . . from statutory determinations concerning computer program products and set the 'dividing line' so the claims in 'computer product format' are proper statutory subject matter and are distinguishable from claims which merely recite the storage of music or text on a memory medium . . . [C]laims reciting that the stored content is 'music' or 'text' fail the utility requirement, because neither the 'text' nor the 'music' interacts to change the operation of the sound reproducer for rendering the stored content audible.

This is like the utility based test described above and ignores common automatic gain control loops which react to the mean amplitude of the recorded signal to adjust gain upon reproduction. Further, certain types of computer programs are absolutely controlled by text. Natural language parsers fall in this category.

The Federal Circuit Bar Associations, in its Amicus Brief, took a procedural approach not unlike the approach taken by the USPTO's proposed guidelines, discussed hereinafter, stating:

19 Amicus brief, page 8.
20 Amicus Brief, page 7.

The fact that such claims may be statutory does not mean that examiners need to consider the novelty of music and text. The printed matter doctrine denies patentable weight to such material. . . . Lowry did not abolish the printed matter doctrine—it survives for writings not functionally related to their substrate. . . .[21] Lowry actually acknowledged the application of the doctrine to arrangements of printed lines or characters, useful and intelligent only to the human mind.

Denying patentable weight to artistic, musical and literary information has the benefit of maintaining the historical distinction between patents and copyrights.

The California Multimedia & Software Patent Alliance brief found that a computer program on a diskette allowed the medium to function as a [patentable] mechanism for driving a computer in discrete sequences and in particular ways while acknowledging:

A different case might be presented in the case of raw audio, video or multimedia data stored on a computer usable medium. Since the primary purpose of such information is aesthetic i.e. to be viewable by or audible to a human and acting only on the senses . . . the question of whether the structural changes imparted by the storage of such information are entitled to patentable weight is a different one.

Classifying the primary purpose of such information as aesthetic is a highly subjective undertaking not conducive to predictability of outcome.

Patent Claims

One should not confuse a patent claim, which is a natural language description of an "invention" designed to distinguish it from that which is in the public domain, with the underlying reality of that which is invented.

Any form of symbolic communication may be useful in describing an invention, including words, sentences, source code, object code, binary code, mathematics, musical notation, graphical symbols or languages newly defined by the inventor to describe the "invention," subject to the usual constraints on definiteness and the like.

Communicative intent is a subjective and inappropriate basis for distinguishing that which is patentable from that which is not. An ant which, in the process of following its instincts, traces a pattern in the sand which most Americans would classify as a picture of George Washington, has no communicative intent notwithstanding the ability

21 Citing *Gulack*.

of the pattern which the ant produced to evoke a common response in human viewers.

Likewise, the fact that an artist produces a painting which evokes an "aesthetic" response in viewers does not mean that communication has occurred. In fact, the wide variation in response of viewers to "art" shows that the same symbolic statement contemplated by a painter and implemented by a painting, for example, is interpreted differently by different viewers and in ways likely quite different from that intended by the painter.

Human to machine communication is indistinguishable from human to human communication either analytically or when tested blind.[22]

A Constitutional Standard for Statutory Subject Matter

Indulge an assumption that best thinking and analysis of good and competent judges has resulted in case law of non-statutory subject matter that is generally correct as a matter of policy. What sort of test would permit discrimination of that which is statutory from that which is not without doing violence to the essential sameness between symbolic representations of computer programs and processes and multimedia "content."

The courts generally agree that the basic tools of scientific research, laws of nature and natural phenomena should be free for all to use. A patent system which did not permit this would restrict, rather promote the progress of science and the useful arts.

The courts also seem to agree that a persons ideas and concepts should be free for use by others to contemplate and build upon, for such freedom of thought is fundamental to a free society. Exchange of ideas is also fundamental to the progress of science and the useful arts.

The Supreme Court seemed to agree with the Committee Report on the 1952 Patent Act, when discussing what is now 35 USC 101, that statutory subject matter was intended to include "everything under the sun made by man."[23]

How can one reconcile the historical limitations on statutory subject matter with the broad expanse accorded 35 U.S.C. 101 by the Supreme Court in *Chakrabarty*? What type of analysis can be applied to predict whether a particular patent claim will be upheld as statutory?

22 Artificially intelligent programs have been written to engage a patient who has sought counselling in dialog. Many patients were unable to distinguish whether they were communicating (keyboard to keyboard) with a machine or with a therapist.

23 Diamond v. Chakrabarty, 447 U.S. 303, 100 S.Ct. 2204, 206 USPQ 193 (1980).

The Freeman-Walter-Abele test[24] was designed to deal with determinations of non-statutory mathematical algorithms. Recent cases have gone beyond the mathematical exception into the area of abstract ideas.[25] Thus the first step of the Freeman-Walter-Abele test needs to be modified to accommodate this expansion. Further, the Freeman-Walter-Abele test doesn't apply to other types of non-statutory subject matter such as those relating to laws of nature.

The second step of the Freeman-Walter-Abele test addresses whether the claim as a whole preempts the algorithm. A number of rules and exceptions have evolved to assist in this determination.[26]

Patenting of any claim *including* a mathematical algorithm (not just those claims which preempt an algorithm) removes the specific use claimed of that algorithm from free use by the public. Yet the existing case law permits such patenting.

A first type of mathematical algorithm may be so specific that it has only a single use in a narrow field of technology. A second type of algorithm may have many uses within the scope of a claim. A third type of algorithm may solve a general class of problems and have wide applicability.

The evil to be prevented by a determination that a claim is non-statutory is not that there is something inherently bad about using mathematics. Mathematics represents just another descriptive language. Rather the concern should be that a patent claim will somehow inhibit rather than promote the progress of science and the useful arts by keeping researchers from aggressively pushing the boundaries of knowledge with mathematical techniques by threat of an infringement action. Beside mathematics, other concerns are that the flow of information needed to expand knowledge will somehow be limited, or that an infringement threat would limit a person's thought processes or that research would stop because something as fundamental as a law of nature had been patented.

Translating the background principles set forth above into a Constitutional standard for statutory subject matter is rather simple.

---

24 In re Freeman, 573 F.2d 1237, 197 USPQ 464 (CCPA, 1978) as modified by In re Walter, 618 F.2d 758, 205 USPQ 397 (CCPA, 1980) and In re Abele, 684 F.2d 902, 214 USPQ 682 (CCPA, 1982). The first step of the test was to determine whether the claims directly or indirectly recite a mathematical algorithm. The second step is to determine if the algorithm is applied in any manner to physical elements or process steps.

25 In re Warmerdam, 33 F3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994).

26 Rules like those which permit ignoring data gathering and insignificant post solution activity or those which seemed at one time to require that the algorithm be applied to a physical step.

Any description of an invention (claim) is presumptively statutory unless the allowance of that claim would reasonably be detrimental to the Constitutional purpose of "promoting the progress of science and the useful arts."

This proposed Constitutional standard allows one to focus less on a complex set of rules and exceptions and more on what is important in determinations of whether or not claimed subject matter is non-statutory.

With the proposed standard, the focus of whether or not artistic expression is non-statutory shifts to the impact of permitting artistic expression to be included in a claim. As pointed out earlier, artistic expression such as literary text can in fact cause a computer to change the order and sequence of operations as in parsing or in a variety of other data driven processes. Thus artistic expression on a disk can be functional in the same sense as Beauregard's computer program on a disk is functional.

For purposes of determining whether a claim containing information or artistic expression is statutory, the question should be does the claim, as a whole, including particular information or artistic expression, restrict the free flow of information and ideas in a way which would adversely impact the progress of science and useful arts. This is different from the question of whether such information or artistic expression should be the basis for distinguishing over the prior art as in *Gulack*.

THE USPTO GUIDELINES FOR THE PATENTABILITY OF COMPUTER IMPLEMENTED INVENTIONS

The adequacy of the Proposed Examination Guidelines for Computer Implemented Inventions will now be considered in light of the history of Beauregard, the nature of software, the principles of symbolic and human-computer communications and the proposed Constitutional standard for determining non-statutory subject matter.

The proposed Guidelines present an essentially procedural approach for determining whether a claim is statutory or not.

Step 1: Interpret the Claims and Classify Them.

After rigorously interpreting the claims in the light of the specification[27], the Examiner is to "classify" the invention as to its statutory category[28], using USPTO defined "presumptions."

The Guidelines require, *inter alia*, that "A claim that clearly defines a computer-implemented process[29] but is not cast as an element of a computer-readable memory or as implemented on a computer should be classified as a statutory 'process'. If applicant protests, the Guidelines require the Examiner to "reject the claim under 35 U.S.C. 112, second paragraph, for failing to recite at least one physical element.... The Examiner should also object to the specification under 37 C.F.R. 1.71(b) ... as the complete invention contemplated by the applicant has not been cast precisely as being an invention within one of the statutory categories."

The implications of such a rule have not been articulated by the USPTO and they do not appear to have been well thought out. This approach does not provide a rational line to help one distinguish what is statutory from that which is not. Rather, it seems to limit the scope of statutory subject matter beyond that permitted by *Chakrabarty*.

The USPTO requirement to reject under 35 U.S.C. 112, second paragraph, would appear to violate an applicant's right to claim "the subject matter which the applicant regards as his invention" established by the very paragraph invoked by the USPTO to reject the claim.

The requirement to object to the specification, is particularly troubling since the only need for an objection, when a rejection is available, would be to achieve an outcome which the USPTO considers favorable by hiding behind the rule making authority of the Commissioner and behind a presumption of administrative correctness. The only remedy for an improper objection, is by petition to the Commissioner, who in this case is proposing the practice. Cost alone will unfairly drive applicants into compliance until someone is willing to bear the expense of getting the practice to a Court for review.

---

27 Particular emphasis is placed on interpreting "means" clauses in accordance with In re Donaldson. 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994).

28 Note that the particular statutory category (process, machine, manufacture or composition of matter) becomes somewhat irrelevant in view of the expansive interpretation of 35 U.S.C. 101 given in *Chakrabarty* and in the proposed Constitutional standard.

29 In view of the USPTO concession in *Beauregard*, the term "computer implemented invention" which became institutionalized in the USPTO with the publication of Lee Barrett's 1989 guidelines is now obsolete. A program on a diskette is not a "computer implemented invention" but it can become such when loaded into a computer.

The Guidelines classify the following, *inter alia*, as *per se* non-statutory:

> A compilation or arrangement of data, independent of any physical element[30].
> A known machine-readable storage medium that is encoded with data representing creative or artistic expression (e.g. a work of music, art or literature)[31].
> A data structure independent of any physical element[33].
> A process that does nothing more than manipulate abstract ideas or concepts (e.g. a process consisting solely of the steps one would follow in solving a mathematical problem).

The first and third categories distinguish the statutory from the non-statutory only on the basis of whether a [possibly prior art] medium is used. There is no technological reason for this distinction and it would appear to permit an infringer who uses network distribution of pirated software to avoid liability for the thousands of electronic but not "physical" copies he sends out.

The second category, while describing a desirable end result does not deal with the fact that as a matter of symbolic communications, many of the traditional forms of artistic expression are indistinguishable from the various expressions of a computer program. Playing the tune "Mary Had a Little Lamb" on a touch tone dial pad may well serve as a tone key which causes a computer program to behave differently and thus be statutory under the Guidelines—but the tune should not distinguish patentably over the same system which uses the opening bars of Beethovan's Fifth Symphony. The reasons it should not are based in the fact that such "trivial" differences are easy to generate because of the large numbers of combinations and permutations of symbols permitted by natural and graphical or visual languages and are somewhat arbitrary. Permitting such distinctions to confer patentability

30 It doesn't seem to matter if this information is control information or poetry. The difficulties of distinguishing program information from a literary text have been addressed above. Under the proposed Constitutional standard, compilations of information would be statutory, but would not necessarily contribute to patentability.

31 The USPTO seems to try to reverse the *Beauregard* majority, by permitting computer program information to be claimed while prohibiting artistic expression. This would be better achieved outside 35 U.S.C. 101 arena by institutionalizing *Gulack* for 35 U.S.C. 102 and 103 purposes.

32 This appears to be an attempt to limit *In re Lowry*, 32 USPQ2d 1031 (Fed. Cir. 1994) to its facts. Claim 1 of *Lowry* called for "A memory for storing data for access ... comprising ... a data structure ... [which contained database information]. The other claims included even more hardware.

would trivialize patents and subject them and the patent system to ridicule.

The fourth category, should not be statutory for the reasons discussed above.

Step 2: Analyze each claim to determine if it complies with §112, second paragraph, and with §112, first paragraph.

A. Specific Utility

The Guidelines require an applicant to disclose one or more "specific utilities" in the specification. Failure to limit the claims to one or more "specific utilities" disclosed in the specification will permissibly result in rejections under both the first and second paragraphs of 35 U.S.C. 112 under the Guidelines.

The Guidelines are based on a new legal theory which appears to grant patents only on the specific utility disclosed in the specification instead of upon all known or obvious utilities covered by a claim supported by one utility. This theory is understandable only if one assumes a desire on the part of the USPTO to make the examination process easy for examiners, regardless of the cost.

B. Computer Languages Prohibited

The Guidelines prohibit defining any portion of claims using a "computer programming language" since such are "not the English Language." English based programming languages become subsets of natural English language, even if they weren't before, as usage of the programming language spreads and any new terms from the language are incorporated into common usage. As discussed above, the requirement seems to lack a clear policy basis since programs and English language text are indistinguishable in any meaningful way and a programming language may be the most accurate way to describe an invention.

C. Means Plus Function Claims Having Programs as Disclosure

Applicants presenting such claims may expect that they will receive a rejection under 35 U.S.C. 112, second paragraph, since this is the Guidelines approved method of shifting the burden to applicant to identify the specific statements in the flow chart, or source code or object code which serve as the "specific acts" relied on in the specification to support the "means" of the claims. Once identified in response to the rejection, the means limitations will likely be so narrow

that the claims can be quickly allowed. Since there are so many ways possible of expressing the same function, if the disclosure is too specific there will be no need to give more than cursory consideration to prior art.

3. *Determination of Statutory Subject Matter*

If the examiner determines that the *specification* discloses statutory subject matter, the examiner must then determine if the *claims* define statutory subject matter. If the disclosure does and the claims do not define statutory subject matter, the examiner is directed to reject the claims under 35 U.S.C. 101 and under 35 U.S.C. 112, second paragraph, with suggestions how to make the claims statutory.

If both disclosure and claims are non-statutory, the Guidelines require that the examiner reject the claims under 35 U.S.C. 101 as non-statutory AND under 35 U.S.C. 112, second paragraph "for failing to particularly point out and distinctly claim an invention entitled to protection under U.S. law."[33]

The USPTO retained a "rare cases" exception for certain claims which follow all the Guidelines but nevertheless "may define non-statutory subject matter."

Comparison with a Constitutional Standard for Statutory Subject Matter

The USPTO Guidelines are considerably complex, appear to do violence with existing legal theories and practice and impose rules and exceptions in pursuit of policy objectives which seem to be at least not clearly articulated.

The proposed constitutional standard, on the other hand, is simple to apply in the USPTO. **Claims are presumptively statutory unless the examiner demonstrates a reasonable basis for determining that the claim would inhibit rather than promote the progress of science and the useful arts.**

The Proposed Constitutional Standard Applied to Selected Recent Cases

A few examples from recent cases highlight some of the differences between the USPTO Guidelines and the proposed Constitutional standard.

33 The necessity of invoking 35 U.S.C. 112, second paragraph, in addition to 35 U.S.C. 101 is unclear and of doubtful propriety in view of the applicant's right to claim "that which applicant regards as his invention." permitted by the that paragraph.

In *Beauregard*, the USPTO proposed guidelines consider a diskette containing a computer program statutory. Under the proposed Constitutional standard, it would also be presumptively statutory, but the proposed standard would permit certain transitional subject matter to be statutory, for example, certain types of multi-media programs which inherently contained literary "content" as well as programming.

In *Lowry*[34], the invention consisted of "a memory for storing data . . . comprising a data structure." Such an invention would be statutory under the USPTO Guidelines and presumptively statutory under the Constitutional standard.[35]

In *Trovato*[36] the invention solved the well known Travelling Salesman Problem. Such an invention would be non-statutory under the proposed Constitutional standard as inhibiting the progress of science and the useful arts by restricting access to an improved way for solving a general class of problems. Mathematical algorithms with only one or a few narrowly circumscribed applications in technology do not have the impact on the progress of science and the useful arts that patenting Trovato's algorithm would have had.

In *Warmerdam*[37], Appellant argued that claims were broad enough to cover methods of physically measuring and determining the medial axis in an attempt to get around, a mathematical algorithm rejection. Method claims 1–4 to "A Method of generating a data structure . . ." and claim 6 to a "data structure generated by the method of any of claims 1–4" were held non-statutory by the Court as "no more than the manipulation of abstract ideas." Claim 5 to a "machine which contains data representing a bubble hierarchy generated by the method of any of Claims 1–4: was held statutory by the Court. The USPTO Guidelines would reach the same result. Given Appellant's argument,

34 In re Lowry, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994).

35 Some uses of the term "data structure" describe nothing more than a template or set of relationships of slots into which groups of data values can be placed in which the data values of each group possess the relationships specified by the template. Data structures of this type are closely related to the semantics of the information stored. Data structures according to this use are subject to numerous unobvious variations without significance. Preferably some minimal threshold of interaction the computer processor ought to be required, ala *Gulack*, for data structures of this type to impart patentability.

36 In re Travato 43 F.3d 1376, 33 USPQ2d 1194 (Fed. Cir. 1994). On July 25, 1995, the Federal Circuit *in banc* withdrew the reported panel opinion and judgement, vacated the decision of the Board of Patent Appeals and Interferences and remanded for reconsideration in light of *Alappat* and any new guidelines adopted by the PTO for examination of computer-implemented inventions.

37 The author was on the panel of the Board of Patent Appeals and Interferences that decided *Warmerdam*, but did not write the opinion. The author reserves the right to ignore anything from his past which might embarrass him.

the Constitutional standard would reach the same result as to claims 1–4. Claim 6 would be presumptively statutory, but would likely not distinguish over the prior art without some disclosed interaction with a computer. Claim 5 would be presumptively statutory and would likely distinguish over the prior art.

In *Chakrabarty* genetically engineered bacteria would be outside the scope of the USPTO Guidelines. Under the proposed Constitutional standard, the invention would be presumptively statutory since it is not naturally occurring.

Conclusion

Unfortunately, as of the writing of this article, the USPTO had not published the "legal analysis" to support their proposed Guidelines. Several USPTO positions appear to be difficult to defend.

The proposed Constitutional standard preserves the vast majority of legal precedent, while creating a theoretical framework which is simple to apply by both examiners and practitioners. The policy objectives it seeks to achieve are visible and clearly defined.

The Constitutional standard has many advantages over the approach taken by the proposed Guidelines. However, much to their credit, the proposed Guidelines have already succeeded in almost guaranteeing the patentability of software products on diskette.[38] While the objectives of the Proposed Guidelines are laudable, the implementation needs very much the public comment[39] which the USPTO solicits.

38 Assuming the Court goes along.

39 Copies of the proposed Guidelines are available over the Internet at the USPTO's home page or from the author at dstewart@cais.com.